

Contract to improve analog-to-digital signal processing *by Francis L. Crumb, Information directorate*

ROME, N.Y. — The Air Force Research Laboratory, as an agent for the Defense Advanced Research Projects Agency, awarded a \$7,900,000 contract to HRL Laboratories of Malibu, Calif., for research designed to increase the speed of analog-to-digital signal processing.

The company will develop and demonstrate an optical analog-to-digital converter capable of dramatic improvements in performance in the range of one billion to 100 billion samples per second – for example, approaching 12- to 14-bit resolution at 10 billion samples per second.

The converter links analog sensor systems (radar, communications and electronic warfare systems) to digital processors that manipulate the signals data. Progress in very-high-resolution, high-sample-rate converter module performance using electronic circuits has been extremely

slow due to design and fabrication limitations.

“We will be using advanced optical components to dramatically enhance the performance of analog-to-digital converters,” said Capt. James A. Louthain, program manager in the Sensors directorate at the AFRL Rome Research Site. “Speed is the primary consideration of this research. We are shooting for speeds 100 to 1,000 times faster than current state-of-the-art converters.”

Louthain said that the technology will enable direct conversion of signals at their source over the entire spectrum of interest for military systems, providing enhanced performance in digital beam-forming to suppress jamming, higher dynamic range for detecting targets in clutter, and broader instantaneous bandwidth for enhanced target identification. @